

by Oxford and Cambridge, by the Royal College of Surgeons, by the teachers of medicine and surgery in the London hospitals, and by others. The matter was referred to the Privy Council, and argued before it in 1834. There was no question then of anything so futile as what has been once or twice suggested for Owens College, the title of university, without the privilege of degrees. The Privy Council found the subject surrounded by difficulties, and adjourned its consideration. Shortly after, Lord Melbourne's Ministry, which was friendly, retired from office, and Sir Robert Peel's, which took the view of the old universities, succeeded. An address to the Crown, however, was carried against the Ministry by 246 to 136, on the motion of Mr. W. Tooke, praying that a charter might be granted to the University of London, with no restriction but that they were not to confer degrees in divinity. The Privy Council was asked to report on the subject, but the report was delayed, and before they presented it Lord Melbourne returned to power. In August, 1835, the Chancellor of the Exchequer, Mr. Spring Rice, communicated to the Council of the existing University College that Government proposed to incorporate by charter as a university in London, a body of gentlemen eminent in learning and science, with the power of examining and granting degrees in arts, medicine, and laws to students of *certain colleges in London, therein named*, and of others existing throughout the country to be afterwards recognised, as well as of the schools of professional education. This university was to be supported by an annual grant. There were to be no religious tests. The existing body, which called itself the University of London, received a charter as a college and was named as one of the colleges entitled to submit students for examination. The two charters to the new university and the new college were issued on November 28, 1835. They have been several times modified. The list of affiliated colleges was always large, and as the Senate of the University had no control over the affiliated colleges it grew unwieldy, institutions of the feeblest character receiving affiliation. In 1863 a charter was granted empowering the Senate to admit persons not educated in affiliated colleges to examination, and this decision creates the University of London of to-day as distinguished from the institution of the same name founded in 1835. About half the students now come from affiliated Colleges and half from anywhere or nowhere. The examinations must be fixed in view of this fact. Examiners must take into account as a most vital matter the books on the subjects of their examination which are readily accessible to students, and they cannot shape their examinations in view of the practice in teaching of any one or more of the affiliated colleges. We hope that the proposed university of the north may have a shorter novitiate, and that she may be conducted in as elevated a spirit and with as resolute a desire to promote the interests of literature and science as the University of London has been. It would have been a painful spectacle if the youngest of our Universities, forgetful of her own early struggles, had spent her energies in an opposition which Oxford and Cambridge have thought unnecessary or unworthy of them. The speech of her Chancellor leads us to hope that the claims of the proposed new university will be considered calmly and on their merits.

#### NICHOLSON'S "LIFE-HISTORY OF THE EARTH"

*The Ancient Life-History of the Earth; a Comprehensive Outline of the Principles and Leading Facts of Palaeontological Science.* By H. Alleyne Nicholson, M.D., D.Sc., M.A., Ph.D. (Gött.), F.R.S.E., F.L.S., Professor of Natural History in the University of St. Andrews. (Edinburgh and London: William Blackwood and Sons, 1877.)

THERE is no feature in which the ordinary geological manuals in common use in this country are more deficient than in the sketches which they give of the leading characteristics of the animal and vegetable life of the successive periods which they describe. The truth of this remark will be made strikingly apparent by a comparison of the works in question with some of the best German treatises on geology, such as those of von Hauer and Credner, and still more if we examine them side by side with that most excellent of text-books, Prof. Dana's "Manual of Geology."

Some writers on geology in this country would indeed appear to hold the opinion that, since the succession of geological formations was first determined in our own islands, an appeal to the facts of British stratigraphical geology must in every case be final in deciding all difficulties which may arise concerning the definition and limits of the different systems of stratified rocks in every part of the globe. Hence the controversies which have taken place in this country concerning the boundaries between the Cambrian and Silurian, the Devonian and Carboniferous, and the Permian and Trias have acquired an altogether factitious importance, and undue weight has been attached to the interpretation of some obscure section, the significance of a local unconformity, or the appearance—often a fallacious one—of a gradual transition between two sets of beds, while far more suggestive facts connected with the relations of the fossil contents of the two series of rocks are too often altogether lost sight of.

But it cannot be too strongly impressed upon the minds of English geologists that the district in which a system of strata is first detected may not necessarily be the one in which it is best adapted to serve as the type of that series; that as a matter of fact the best illustration of the features and relations of the Cambrian and Silurian is to be found, not in Wales, but in Bohemia; and of the Devonian, not in Devonshire, but in the Eifel. English students, too, need to be reminded that the classification of the stratified rocks is based not upon the occurrence of certain physical breaks, in the continuity of a series of beds, which are often, indeed, of very local character and small importance, but upon the great principle that each formation is characterised by a well-marked and distinctive fauna or flora. Concerning the fact, position, and significance of many of the physical breaks in the succession of formations, the ablest field-geologists, such as Sedgwick and Murchison, Jukes and Godwin-Austen, have frequently arrived at very opposite conclusions; and the importance which has been attached to these discussions on points of details has doubtless led many to entertain a notion of the instability of the foundations of the geological systems of classification which is very far from

having any real foundation in fact. For it must not be forgotten that, however certain questions now pending concerning the nomenclature of the Welsh strata may eventually be decided—and these questions of nomenclature and priority are, after all, of very secondary importance—the grand fact first clearly determined by the discoveries of the illustrious Barrande in Bohemia, that there can be distinguished in the series of older Palæozoic strata three great divisions, each characterised by a well-defined fauna, is quite independent of these controverted points, and its value cannot be affected in any way by their decision either one way or the other.

It will be manifest from what we have said above that we regard the present work of Prof. Nicholson as dealing with a subject in connection with which the want of a competent text-book in this country has long been a serious evil; and of the general accuracy and reliability of the information supplied by this convenient little volume we can also speak in terms of high commendation.

Prof. Nicholson has wisely availed himself to the fullest extent of woodcut illustrations in aid of his descriptions of the fossil forms; and the 270 engravings, many of them containing illustrations of a number of different species, will be a great boon to the geological student. Some of these woodcuts now appear for the first time, but others have already done duty in the author's previous writings. We cannot unfortunately award anything like equal praise to all these illustrations, for while some of them are of exquisite truthfulness, detail, and finish, certain others are so coarsely executed and so wanting in character, that it is a marvel to us how so accomplished a naturalist as the author could have ever permitted them to disfigure his pages. There is one omission in connection with the illustrations, which will greatly detract, we fear, from the value which they would otherwise have for the student, namely, the absence of indications of the number of times which the scale of the drawings is magnified or reduced from that of the original objects. Every one engaged in teaching is aware what erroneous notions concerning fossil forms are often propagated by want of attention to this detail.

In his discussion of the characters distinguishing the flora and fauna of each of the great geological periods, Prof. Nicholson is usually very clear in his descriptions and happy in his choice of typical forms. The greatest danger which besets the writer of such a work as the present is that of overwhelming the student with masses of detail, unrelieved by those broader generalisations which may serve to aid his memory in grouping the facts about convenient centres. Had Prof. Nicholson in the present work prefaced each of his descriptions of the great geological periods with a succinct statement of its leading palæontological characteristics, and also furnished similar summaries for the greater epochs, we cannot but think that the work would have been far better adapted to the wants of the student, and at the same time its suitability for general readers would have been in no wise impaired.

The references to authorities at the end of the chapters will be found useful by all classes of readers, and the general remarks on the "Principles of Palæontology" with which the work opens will sufficiently prepare those who may be totally unacquainted even with the funda-

mental facts of geological science for a profitable perusal of the succeeding chapters. The work before us constitutes a popular exposition and summary of the facts of palæontology, suitably arranged for beginners; but as a text-book for the more advanced student of the science, it still leaves much to be desired. We search it in vain, for example, for information on many important questions, such as the classification of the multifarious forms grouped under the name of *Ammonites*, and we sometimes find obsolete names employed for certain genera and species. There are certain obvious errors and omissions which will doubtless be corrected and supplied in a subsequent edition of the work—such, for example, as the table of Cambrian strata on p. 79, and the absence of all notice of the remarkable Devonian fossil, *Calceola sandalina*.

As a compact and popularly written introduction to a very important department of science, Prof. Nicholson's new work may be safely recommended; and it is well worthy to take its place among that series of useful manuals for which we are already indebted to its industrious author.

#### OUR BOOK SHELF

*Geological Survey of Canada. Report of Progress for 1874-75.* Alfred R. C. Selwyn, F.R.S., F.G.S., Director. (Published by Authority of Parliament, 1876.)

ALTHOUGH Mr. Selwyn, like his predecessor, Sir William Logan, has the highest possible ideal of the importance of pure geological mapping, the necessity for the rapid exploration of a vast unsurveyed new land simultaneously with the development of rich coalfields, compels him to employ two very different systems of working. With a staff of only ten geologists, two-thirds of whose time is engrossed by topographical preliminaries, the usefulness of the survey as a whole must depend to a great extent on the judicious determination of the degree of importance attached to the details of its various parts. Accordingly, Mr. Selwyn has confined the detailed mapping to the settled eastern sea-board, carrying on at the same time reconnaissances in the central and western regions, where complete maps will not be demanded for some time to come.

During the past year Mr. Selwyn has been able, in addition to his administrative duties, to overtake some field-work, chiefly among the palæozoic rocks of New Brunswick and the coalfields of Cumberland and Sydney. The Report contains two geological maps of portions of the Cape Breton Coalfield, by Messrs. Robb and Fletcher, exhibiting all the completeness of the British coalfield maps.

Mr. R. W. Ells furnishes a map and report on the hematite ores of Carleton County, New Brunswick. The ore appears to occur in veins along the strike of highly-inclined Silurian rocks.

Mr. Henry G. Vennor has been surveying in the Laurentian region of Frontenac and Lanark Counties, and embodies the results of his labours in a map and report. It appears that apatite mining in this district has recently ceased to be a profitable industry. Mr. Vennor sees the cause of failure in the injudicious and costly manner in which the mining was carried on. Iron ore (magnetite) occurs at Eagle Lake in a bedded form, associated with hornblende and dioritic rocks.

Mr. Robert Bell and Mr. Joseph Spencer describe the country between the head-waters of the Assiniboine River and Lakes Manitoba and Winnipegosis. During a rapid survey of this little-known tract, they recorded the occurrence of Laurentian schists and rocks of Huronian,